

Lumber and the War¹

A. C. Cline²

This paper emphasizes the basic importance of forest products in the war and outlines the efforts being made by the War Production Board and the Forest Service to assist industry in meeting essential military and civilian needs. Stress is also laid on the relative scarcity of accessible high-quality timber, particularly in hardwoods, and on the necessity for practicing forestry as the only means of assuring adequate future supplies.

THE war undoubtedly has greatly increased the use of forest products, both in respect to the quantity consumed and the variety of ways in which wood has been put to work in supplying our military needs. The quantitative increase in consumption in 1942 as compared with years just before the war is approximately 17 billion feet, but the importance of this additional volume cannot be measured in board feet alone. Wood, more than any other basic raw material, has relieved the pressure on critical metals, thus making possible a more complete diversion of indispensable steel, copper, aluminum, and various metallic alloys to war uses. As stated by Wilson Compton,³ "Wood is now recognized as one of the most generally useful industrial materials, in war as in peace. Its greatest contribution will be not only to supply direct war needs, but also to furnish practical substitutes for scarce materials needed for fighting tools." This, you will agree, is an elevated position in comparison with that held by wood immediately before the war.

NEW AND IMPROVED USES OF WOOD

As is always the case in times of emergency, inventive ability is stimulated to find new and better ways of producing the things we need. Excellent articles on war uses of wood have been written by Carlile P. Winslow, director of the Forest Products Laboratory, George W. Trayer, chief of the Division of Forest Products in the Forest Service, and many others. I shall refer only to a few of the more important uses, as I see them.

Pressing needs for a vast fleet of airplanes, cargo ships, subchasers, mine sweepers, torpedo boats, and similar craft, together with innumer-

able other special military uses, have encouraged new developments in the production and use of wood, especially plywood. So-called molded plywood has made great strides under the impetus of war, being well-adapted for building cargo planes, gliders, and other types of aircraft; and plans are now being formulated for huge multi-motored passenger and freight planes to be constructed largely of plywood. The place of wood in aircraft seems assured. There have been new gains in the development of stronger waterproof adhesives in plywood construction; and veneer is being produced with greater precision in dimension than ever before. Improved thermo-static control of veneer drying results in a more uniform product and reduced waste, while high frequency electrostatic heating speeds up plywood fabrication.

Plastic-bonded laminated wood, "plastic" wood, "impregnated" and "compregnated" wood all give promise of great usefulness in the manufacture of many articles, not merely because of war needs and the shortage of metals, but because they are actually more satisfactory for certain purposes.

The enormous increase in the use of wooden containers to carry food, munitions, and other necessities of war to our fighting forces abroad has called for an intensification of research in the container field. Shipments must be so packed as to be free from moisture, rust, and decay, readily unpacked, yet protected against pilferage, and so designed as to conserve weight and cargo space. Improvements in container design resulting from war needs undoubtedly will carry over into peacetime shipping practices.

Progress is being made in the more economic use of wood. While there still is a tendency to overdesign wooden structures, Dr. Compton in the article already referred to states that "much has been contributed to economy in building designs by the development of the Teco-connector system of timber construction and the use of laminated timber arches"; and that "Army and

¹Presented before the Allegheny Section, Society of American Foresters, February 26, 1943.

²Deputy chief, Program Section, Lumber and Lumber Products Division, War Production Board, Washington, D. C.

³Compton, Wilson. Forest products shortages are fears not facts. *Miss. Val. Lumberman*, January 15, 1943.

Navy designers within the past year have learned how to make 88 feet of lumber connector constructions do work formerly requiring 100 feet."

The war has demanded faster and more exacting lumber-drying methods. The Forest Products Laboratory has experimented with "chemical seasoning." Birch rapidly dried, and increased in hardness by chemical treatment,⁴ may be used as a substitute for dogwood and persimmon, formerly considered indispensable for making shuttles, a very critical item at the present time. These are but a few examples of the new developments in the use of wood for the exacting needs of warfare.

You may ask to what extent this expanded and more diversified use of wood will outlast the present emergency. There is little doubt, I believe, that the superior qualities of wood for certain special purposes will be more definitely established as a result of war than ever before. We should recall that the properties of wood were better known to our ancestors than to the present generation, and that the more or less prevalent concept that wood is a thing of the past is due in no small measure to trade promotion practices on the part of more highly organized competitive industries. Many laymen undoubtedly would be astonished to know to what extent wood for certain important uses has no acceptable substitutes. Some of these have been highlighted by the present difficulty of meeting all the needs of the armed forces and essential civilian requirements as well. It would not be in the interest of the war effort to list these most essential uses of wood, but I am sure everyone present knows some of them.

A good many of the "critical" species are hardwoods which grow right here in our eastern forests and in which you are naturally particularly interested. As we all know, they exhibit a wider range in texture, hardness, and other properties, and hence a wider range in utility, than softwoods. Although in terms of quantity consumed, the softwoods are by far the more important, the hardwoods are none the less vitally important for a number of specific military needs. Oftentimes, only a very small part in a large machine is essential to the proper functioning of the whole. One has only to mention dogwood bobbins and hickory picker sticks as part of a loom to illustrate the point.

⁴Winslow, Carlile P. Wood and war. Jour. Forestry 40:920-922. 1942.

CONSERVATION OF CRITICAL SPECIES BY WAR PRODUCTION BOARD

Exacting war demands for particular technical properties in wood have centered special attention on certain species. It is fair to say that species, as such, has taken on greater significance because of the war. So important have certain species become that the War Production Board has found it necessary to curtail or prohibit their use for nonessential purposes.

To cite a few examples, General Conservation Order M-209 prohibits the use of white oak logs for the manufacture of veneer, except for implements of war. Its purpose is to divert a larger share of such logs into timbers and other stock for ship construction. Conservation Order M-279 prohibits the processing of any Select or Grade No. 1 yellow poplar aircraft logs into material other than aircraft veneer or aero-grade lumber. General Preference Order M-186 provides that no person shall make delivery of, consume, or process Sitka spruce logs except as authorized by the Director of Industry Operations. Needless to say, this species is being channeled for use in the manufacture of aircraft. Like provisions apply to noble fir and western hemlock, western softwood alternates of Sitka spruce for aircraft lumber.

Douglas fir, outstanding commercial softwood species in recent years, continues to make a major contribution to our lumber needs. General Preference Order M-234 grants authority to the Director General of Operations to allocate Douglas fir logs. Limitation Order L-218 prohibits any producer from selling, shipping, or delivering any restricted Douglas fir lumber (the higher grades) except to the Central Procuring Agency, the Corps of Engineers of the United States Army. And amended Conservation Order M-208, for all softwood lumber, restricts the use of even the lower grades of Douglas fir.

We cannot begin to appraise at this time all of the many ways in which the war is affecting the use of forest products, whether through the impact of direct demand or the indirect effects of the various emergency controls on production and price. The establishment by the Office of Price Administration of maximum prices for lumber and other forest products, by species, grades, and other specifications, probably has affected use in one way or another in many cases. Other things being equal, a logger or a lumber manufacturer who has a choice in the matter will generally concentrate his efforts on those

products which return the greatest profit. So great is the diversity of products made from logs, such as lumber, cooperage stock, veneer, and railroad ties, that it is impossible to set specific ceiling prices which are equitable for all. Thus, unavoidably, there is danger of setting up conflicts between certain uses which in some instances may have more than a temporary existence.

But, unfair or irritating as these inequities may be to industry, they are as nothing compared with the chaos which would result from the absence of price controls and of other controls which have been placed on lumber by the War Production Board. Not only would a free market bring on all the evils of runaway inflation, but, under present conditions of limited manpower, raw materials, and transportation facilities, it is certain that the supply of lumber and other forest products needed by our military forces would break down completely.

ACTIVITIES OF LUMBER AND LUMBER PRODUCTS DIVISION

This brings me to say something about the work of the Lumber and Lumber Products Division of the War Production Board, with which I and a number of other members of this Society are associated. The backbone of control over the production of the lumber industry is the system of priorities, which, on the one hand, controls the distribution of production machinery, equipment, repair parts, trucks, and tractors, and, on the other, the distribution of the products of the industry. The latter are divided among fourteen claimant agencies, which together account for the total lumber requirements of the military forces and the civilian population, both our own and those of our allies. Included among them, in addition to the Army and Navy, are the Maritime Commission, the Office of Civilian Supply, the Board of Economic Warfare, and the Office of Lend-Lease Administration.

The extent to which control is exercised varies with the stringency of a given situation and the essentiality of the product or material involved. Control is formalized chiefly through the issuance of preference rating orders, limitation and conservation orders, and program determinations, the last-mentioned of which direct the allocation of materials or products in specific amounts to specific users. It is quite outside the scope of this paper to enter into the intricacies of prior-

ities and allocations. Suffice it to say that the channeling of forest products to first uses first is an undertaking which grows in scope and intensity with the prolongation of the war and the accompanying transformation from a peace to a war economy. This difficult task falls to the Lumber and Lumber Products Division of the War Production Board.

The present director of the Division is J. Philip Boyd, formerly manager of various sales divisions of the Weyerhaeuser organization, and more recently chairman of the Lumber Committee of the Army-Navy Munitions Board, a man well acquainted with the lumber industry throughout the country. Mr. Boyd succeeded Arthur Upson, a well-known forester and longtime member of the Society of American Foresters, who resigned on January 19.

In achieving its objective of gearing the lumber industry to the war program, the division must bring together a great deal of information regarding lumber production and requirements. Only when this information is at hand can the available supply be apportioned to meet most essential needs. This responsibility falls in a large measure to the Program Section of the Division, whose chief is the secretary of the Society and managing editor of the JOURNAL OF FORESTRY (now on leave), Henry Clepper. The Program Section and three other staff sections—Distribution, Resources, and Administration—coordinate the primary functions of the Division. Eight operating sections supervise the several branches of the lumber and lumber products industry, their raw material and equipment needs, and the distribution of their products. Advice from the industry itself is provided through the medium of twelve industry advisory committees, which meet regularly with representatives of the operating sections of the Lumber Division to discuss industry problems and their solution. Additional contacts with industry are maintained through twelve regional offices and a number of lumber advisers, several of whom are foresters, located throughout the producing regions. You will be interested to know that in the various branches of the War Production Board there are in all some thirty foresters employed.

FOREST SERVICE COOPERATION

As many of those present well know, the United States Forest Service, under cooperative arrangements with the War Production Board, has been

of great assistance to the Lumber and Lumber Products Division in gathering statistical information. Among the many tasks performed by the Service may be mentioned estimates of the supply of black walnut for gunstocks, white oak for ship timbers, Sitka spruce for aircraft lumber, and chestnut wood and mangrove bark for tannic extract; reports on the use of wood in such fabricated products as truck bodies, Army cots, cargo ships, and airplanes; estimates of lumber consumption by regions, uses, and species; and numerous studies relating to the production of lumber and lumber products. The Forest Service prepares monthly reports of lumber production by regions and species and quarterly reports on lumber stocks and factors affecting lumber production; and it cooperates with the Bureau of the Census in the annual canvass of lumber production. Field checks have been made on industry applications for logging and milling equipment, and special studies undertaken of the use of portable power saws for falling and bucking, and of lumber carriers and stackers, as labor-saving devices. These are some of the many ways in which foresters employed by the Forest Service are contributing to the work of the War Production Board and to the successful prosecution of the war.

Doubtless you have heard something about the new plan, approved by the President February 26, to increase the production of lumber through cooperation between the Lumber and Lumber Products Division of the War Production Board and the Forest Service. This involves giving assistance to loggers and sawmill operators in numerous ways, such as explaining government regulations and orders, helping them obtain necessary logging and milling equipment, repair parts, trucks, and tires, giving technical aid in logging and milling techniques, and helping in the placements of orders. The plan also contemplates cooperation with the War Manpower Commission in locating and transporting labor, and with state foresters and extension foresters in locating and making available additional stumpage supplies. There is no doubt that a renewed effort should be put forth to brace up the now lagging production of lumber, and it is expected that the plan will be implemented immediately. Such an undertaking will provide still further opportunities for foresters to be of service in winning the war on the home front.

PROSPECTS FOR 1943 LUMBER PRODUCTION

The present over-all lumber supply and requirement situation is such as to cause concern. Lumber consumption for 1942 is estimated to have been a little over 40 billion board feet. This was met by production of around 33 billion feet, withdrawals from stocks of about 5.5 billion feet, and imports of about 1.5 billion feet. Thus, as far as 1942 is concerned, all essential needs were met, as well as some which were not so essential. Future production is surrounded by much uncertainty, but it is expected by the industry itself that 1943 production will decline about 10 per cent as compared with 1942. The Forest Service predicts a production of a little over 30 billion feet, while the War Production Board has set the goal at 32 billion feet.

Thus far in 1943, production has fallen off considerably more than 10 per cent, in comparison with the same period in 1942, perhaps as much as 20 per cent. But the year is still young, and much can happen to stimulate production between now and December 31. The industry is doing its best. The attainment of this year's goal depends upon maintaining last year's levels of manpower, tractors, trucks, tires, repair parts, and other necessities of production. Needless to say, some of these factors are only partially under the control of the War Production Board.

I shall not attempt even to list all the factors which are affecting production, but it may interest you to know something of the Forest Service report on this subject for the last quarter of 1942. Out of the fourteen sections of the country reported on, labor shortage was found to be the main obstacle to production in ten; and in only three was unfavorable weather the leading factor. Since weather is one thing which is beyond our control, manpower remains as the outstanding problem at this time.

A recent report on New England lumber conditions, which may be representative of the Northeast generally, states that the wage setup in the industry there is so low that, even with a considerable increase, it would not be competitive with other industries, with the result that woods and sawmill labor continues to drift away. Price ceilings are cited as another important factor operating against increased production. I believe we can agree that these problems of manpower and pricing are susceptible of solution,

though not without a great deal of study and planning.

FORESTRY ESSENTIAL TO ASSURE FUTURE SUPPLIES

I cannot bring this paper to a close without some comments on forest conditions and what they mean to foresters, particularly those of us working here in the Northeast. We must recognize the fact that the forests of this once heavily timbered region are contributing comparatively little toward our war needs for wood, not because the forested area is small by comparison with other regions, but, rather, because of the depleted and deteriorated condition of the growing stocks. Stands capable of producing veneer logs, ship timbers, and high-grade lumber are few and far between. Many billions of feet of fine timber have passed through the saws since the days when the agents of the Crown placed the King's broad arrow on choice white pine mast trees for the British Navy. Yet this was only a single sawtimber rotation ago, if measured in terms of high-quality lumber and veneer logs. Even if sawtimber silviculture had been practiced on our earliest hardwood cuttings, we should only now be reaping a harvest of high-grade logs. But, as we all know, scarcely a beginning has been made in the application of forestry to the hardwood areas of the region.

I already have referred to the critical state of the supply of certain hardwoods. It goes without saying that the shortage is in the products requiring the higher grades of timber, and not in those which can be made from inferior, small-sized "second growth." It is not a question of whether there is enough hardwood sawtimber stumpage in the country to meet the needs of this war. Undoubtedly, there is. It is, rather, a question of plans for the future, of how to fit forest production to the needs of a growing nation, with increasing obligations to share its resources with the rest of the world. If I am any judge of the future requirements of the United States, we urgently need to increase the production of high-grade hardwood timber on the better forest soils in many parts of this region. This is by no means merely a matter of fire protec-

tion and time, but also one of practicing forestry. Nature unaided is extremely wasteful in the production of hardwood timber of high quality. The yields of the very best old-growth stands ordinarily were only from five to ten thousand feet per acre of high-grade material, whereas under proper management we can produce ten times as much in a similar length of time.

We need to favor the better hardwood species such as yellow birch, hard maple, white ash, basswood, yellow poplar, white and red oak, and hickory. Unfortunately, many of the better species are exacting in their soil and moisture requirements; and their abundance has been greatly reduced over the past two hundred years by a decline in forest soil fertility caused by repeated clear cutting and fire. Even if we should start out immediately on the task of building up the sawtimber production of our northeastern forests, it would not be until the turn of the next century that any large cuts of high-quality material would be possible.

I have stated (on the strength of reliable estimates) that there is enough standing hardwood sawtimber to meet the needs of this war, that is, without regard to its location or distribution in relation to convenience of logging or transportation. We all know that the best and most accessible timber in the region was cut long ago, and that we must now go farther over the hill and into the swamp to find good stands. No one knows to what extent the isolated and inaccessible character of existing stands has increased the manpower and transportation units now required to cut and deliver a thousand feet of sawlogs, but we may be sure that the increase is very great. It may be fairly said that the manpower problem in the lumber industry in the Northeast is very definitely related to forest depletion.

In conclusion, let me repeat that the war has greatly increased the importance and value of lumber and lumber products. It has strengthened our faith in the future of wood. It has stimulated our thinking about plans for building up forest growing stocks and increasing lumber production in the future. As foresters, we are faced with an undertaking of vast proportions, one which will require the utmost in devotion and hard work for many decades to come.